

FOUR NEW SPECIES OF SCALIBREGMATIDAE  
(POLYCHAETA) FROM THE GULF OF MEXICO, WITH  
COMMENTS ON THE FAMILIAL PLACEMENT OF  
*MUCIBREGMA* FAUCHALD AND HANCOCK, 1981

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*Abstract.*—Four new species of Scalibregmatidae (Polychaeta) are described from the Gulf of Mexico: *Asclerocheilus mexicanus*, *Hyboscolex quadricincta*, *Neolipobranchius blakei*, and *Sclerocheilus unoculus*. *Mucibregma* Fauchald and Hancock, 1981, is probably referable to the Fauveliopsidae.

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Recent systematic studies on scalibregmatid polychaetes have resulted in a generic review and classification (Kudenov and Blake 1978), and subsequent clarification and refinement of this scheme (Blake 1981). In all, 15 genera and 46 species of scalibregmatids have been described (Blake 1981; Fauchald and Hancock 1981), not including the undescribed genus represented by *Asclerocheilus californicus* Hartman (Blake 1981). Four new species are described here, including *Asclerocheilus mexicanus*, *Hyboscolex quadricincta*, *Neolipobranchius blakei*, and *Sclerocheilus unoculus*. The generic definition of *Neolipobranchius* is emended, and the recently described genus *Mucibregma* Fauchald and Hancock, 1981, is tentatively referred to the Fauveliopsidae Hartman and Fauchald 1971.

This study is based on two small collections from the Gulf of Mexico. One collection derives from the Hourglass Cruises (Kudenov 1985), and was kindly made available by Thomas H. Perkins, Florida Department of Natural Resources, St. Petersburg, Florida. The other was taken as part of the Bureau of Land Management's Outer Continental Shelf Baseline Environmental Survey along the coasts of Mississippi, Alabama, and Florida (MAFLA) and southwest Florida (SOWFLA). All MAFLA samples were collected by Dames and Moore, and SOWFLA samples by Woodward-Clyde Environmental Consultants. Details of the MAFLA survey are given by Dames and Moore (1979). These materials were generously made available by Paul G. Johnson and Joan Uebelacker, Barry Vittor and Associates, Mobile, Alabama (Kudenov 1984). All materials including most types are deposited in the National Museum of Natural History, Smithsonian Institution, Washington D.C. (USNM); two paratypes are also deposited in the Invertebrate Reference Collection of the Florida Department of Natural Resources Marine Research Laboratory, St. Petersburg, Florida (FSBC I).

*Asclerocheilus mexicanus*, new species

Fig. 1

*Material examined.*—FLORIDA, GULF OF MEXICO: MAFLA sta 2211G, 27°56'29.5"N, 83°52'59.5"W, 43 m, Nov 1977; 1 paratype (USNM 97267). Sta 2211H, same, Jun 1976; 1 paratype (USNM 97268). Sta 2423J, 29°37'00.8"N, 84°29'58.4"W, 19 m, silty fine sand, Jul 1976; 1 paratype (USNM 97265). Sta

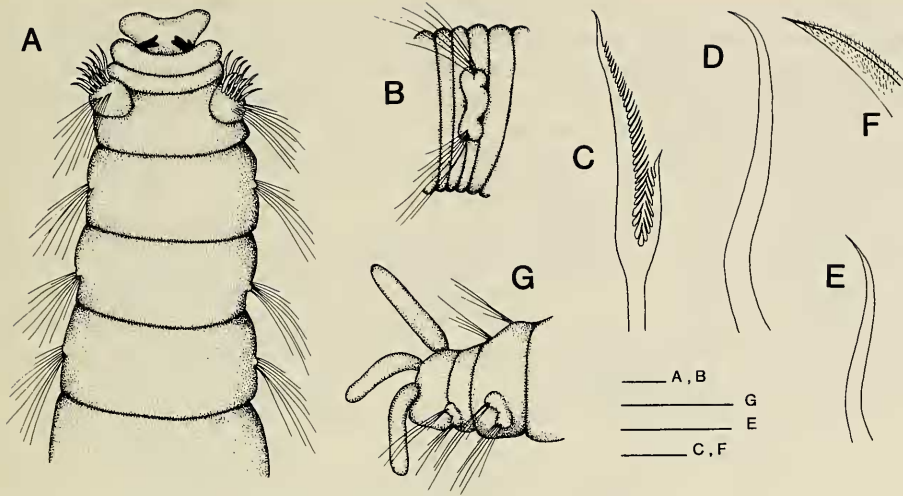


Fig. 1. *Asclerocheilus mexicanus* (holotype, USNM 97264): A, Anterior end, dorsal view; B, Parapodium, right setiger; C, Furcate seta; D, Notoaciculum from first row of setiger 1; E, Same from second row of setiger 1; F, Detail of tip of aciculum from setiger 1; G, Pygidium, lateral view. Scale: A, B = 2 mm; D, E = 40  $\mu$ m; C, F = 10  $\mu$ m; G = 100  $\mu$ m.

2852E, 28°30'00.4"N, 83°29'58.4"W, 22 m, medium sand, Aug 1977; 1 paratype (USNM 97266). Sta 2528H, 29°54'58.6"N, 86°04'58.5"W, 37 m, coarse sand, no date; holotype (USNM 97264). Sta 2853C, 29°18'01.9"N, 84°19'59"W, 29 m, coarse sand, Aug 1977; 1 specimen (USNM 97269). Hourglass sta C, 27°37'N, 83°28'W, 38 m, sponge-algae-coral bottom, 5 Oct 1967; 1 paratype (FSBC I 31310).

**Description.**—Body arenicoliform, widest anteriorly, measuring up to 10 mm long, 0.9 mm wide, for 46 segments; opaque white in alcohol. Prostomium T-shaped, wider than long, with lateral process stout, distally blunt (Fig. 1A). Eyes numbering 2 pairs, partly fused along inner margins of a given pair (Fig. 1A). Buccal segment apodous, achaetous, uni- to biannulate dorsally and laterally, fused ventrally with setiger 1 (Fig. 1A). Parapodia biramous, poorly developed, resembling small conical papillae anteriorly (Fig. 1A), and flattened lobes posteriorly (Fig. 1B). Setae include smooth capillaries in all rami, furcate setae having tines of unequal lengths in all rami except first notopodium (Fig. 1C), and acicular spines having recurved, distally pointed shafts with minutely hirsute distal sheaths in the notopodia of setiger 1 only (Fig. 1A, F). Acicular spines arranged in 2 transverse rows, with 5–6 spines in the first (Fig. 1A, D), and 4–5 in the second (Fig. 1A, E). Pygidium damaged, with at least 3 anal cirri (Fig. 1G). Body segments indistinctly annulate, with anterior and posterior ones normally uniannulate (sometimes biannulate); medial ones tri- or quadriannulate (Fig. 1A, B, G).

**Remarks.**—*Asclerocheilus mexicanus* is most closely allied to *A. acirratus* (Hartman, 1966) and *A. tropicus* (Blake, 1981), in having acicular spines confined to the notopodia of setiger 1. There are two rows of these spines in both *A. mexicanus* and *A. tropicus*, and 1 in *A. acirratus*. *Asclerocheilus mexicanus* differs from *A. tropicus* in having stout, conical prostomial processes instead of flattened lateral

wings; in having two pairs of eyes with dense ocelli, arranged obliquely and partially fused along their inner margins, rather than longitudinal lines of separate ocelli; in having acicular spines of two different sizes; in having furcate setae with parallel instead of divergent tines; in lacking body reticulae; and in having pygidial cirri. Tine ratios for the two species also differ, with 2.48 for *A. mexicanus*, and 2.66 for *A. tropicus* (Blake, 1981). Refer to Discussion for a further treatment of this character.

*Asclerocheilus mexicanus* is also related to *A. ashworthi* Blake, 1981, *A. beringianus* Uschakov, 1955, and *A. heterochaetus* Kudenov and Blake, 1978, in having only notoacicular spines. However, these spines are present in setigers 1–2 in both *A. ashworthi* and *A. beringianus*, and setigers 1–4 in *A. heterochaetus*.

*Etymology*.—The epithet derives from the Gulf of Mexico, and is an adjective formed from the noun Mexico.

*Distribution*.—Northeastern Gulf of Mexico, 18–31 m.

*Hyboscolex quadricincta*, new species

Fig. 2

*Material examined*.—FLORIDA, GULF OF MEXICO: MAFLA sta 2852E, 28°30'00.4"N, 83°29'58.4"W, 22 m, medium sand, Aug 1977; 4 paratypes (USNM 97277). Hourglass sta B, 27°37'N, 83°07'W, 18 m, EJ-65-365, sponge-coral, 3 Dec 1965; 1 paratype (USNM 97271). Same, EJ-66-73, mud, coral, dead shell, 3 Mar 1966; 1 paratype (USNM 97272). Same, EJ-67-160, sand, rock, algae, 11 May 1967; 2 paratypes (USNM 97273). Same, EJ-67-179, sponge, coral and shell, 20 May 1967; holotype (USNM 97270), 1 paratype (USNM 97425). Same, EJ-67-213, sponge, coral, algae and shell debris, 2 Jun 1967; 1 paratype (USNM 97274). Same, EJ-67-328, sponge, algae, coral, 11 Sep 1967; 1 paratype (USNM 97275). Same, EJ-67-389, shell, algae, sponge and coral bottom, 20 Nov 1967; 1 specimen (USNM 97278). Sta J, 26°24'N, 82°28'W, 18 m, coral and sponge bottom, 6 Dec 1966; 1 paratype (USNM 97276). Same, 26°24'N, 82°25'W, EJ-66-194, 18 m, coral and algae, 11 May 1966; 3 specimens (USNM 97279). Same, EJ-66-460, coral and sponge bottom, 6 Dec 1966; 1 paratype (USNM 97425). Same, EJ-66-469, 1 paratype (FSBC I 31388). Sta K, 26°24'N, 82°58'W, 31 m, EJ-67-383, sand, sponge bottom, 14 Nov 1967; 1 specimen (USNM 97280). Sta 12 I-BC-C, EJ-81-104, Citrus County, Crystal River, approximately 18 km at 214 from mainland, mouth of discharge canal, 0.6 m, primarily exposed limestone overlain by muddy sand, 14 Apr 1981; 1 specimen (USNM 97281).

*Description*.—Body arenicoliform, widest anteriorly, measuring up to 13 mm long, 1.4 mm wide, for up to 69 setigers; opaque white in alcohol. Prostomium with stout lateral processes about as long as wide (Fig. 2A). Eyes numbering 2 pairs, arranged in 2 parallel to diverging rows of pigment (Fig. 2A, B). Buccal segment apodous, achaetous, uniannulate dorsally and laterally, fused ventrally with setiger 1 (Fig. 2A, B). Parapodia biramous, projecting slightly above body wall, resembling flat mounts anteriorly, becoming small conical lobes posteriorly (Fig. 2A). Spinulose capillary setae (Fig. 2C) and furcate setae with unequal tines (Fig. 2D) present in all rami. Pygidium variably developed, with 4–6 anal cirri (Fig. 2E–G). Body segments annulated with buccal segment and setigers 1, 44–59 uniannulate; setigers 2–4 and 27–43 biannulate; setigers 5–6 triannulate; setigers 7–32 quadriannulate (Fig. 2A, E–G).



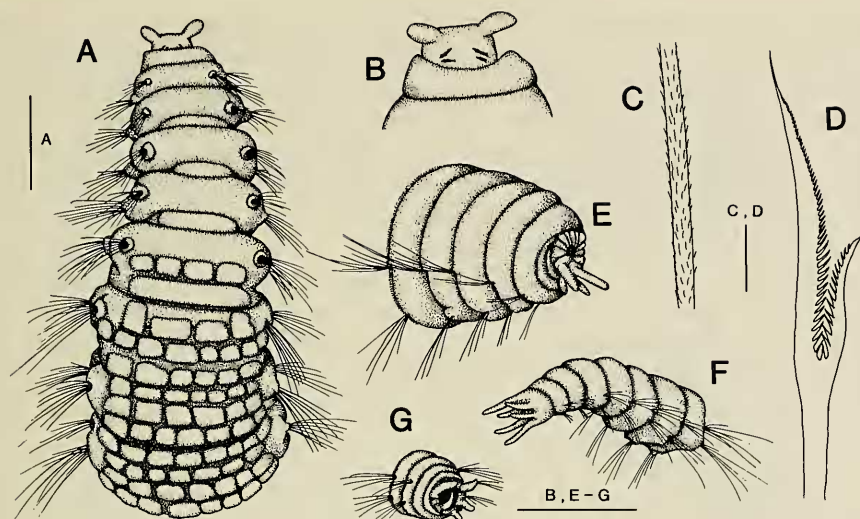


Fig. 2. *Hyboscolex quadricincta*: A-E, holotype (USNM 97270); F, paratype (MAFLA 2852E: USNM 97277); G, paratype (EJ-66-73:USNM 97272). A, Anterior end, dorsal view; B, head region, dorsal view; C, Spinulose capillary seta, detail of shaft; D, Furcate seta; E, Pygidium, left frontolateral view; F, Same, right frontolateral view; G, Same, left frontolateral view. Scale: A-B, E-G = 0.5 mm; C, D = 10  $\mu$ m.

**Remarks.**—*Hyboscolex quadricincta* is most closely allied to *H. pacificus* (Moore, 1909) in the shape of the prostomium, configuration and placement of the eyes (Berkeley and Berkeley 1952:59), and in having a variable number of anal cirri (Imajima and Hartman 1964:304). *Hyboscolex quadricincta* differs in having anterior body segments quadriannulate, instead of triannulate or biannulate, in having spinulose capillaries, instead of smooth ones, and in having 4–6 anal cirri, rather than 0 or 6–7. It is noteworthy that furcate setae of *H. quadricincta* have a tine ratio of 2.4 compared to 1.7 determined from seven specimens of *H. pacificus* loaned by the Allan Hancock Foundation (AHF N2394).

**Etymology.**—The epithet derives from the presence of four transverse annuli on most body segments.

**Distribution.**—Northeastern Gulf of Mexico, 0.6–31 m.

#### *Neolipobranchius* Hartman and Fauchald, 1971, emended

**Type-species.**—*Neolipobranchius glaber* (as *glabrus*) Hartman and Fauchald, 1971, by original designation.

**Description.**—Body maggot-like, widest anteriorly, tapering posteriorly. Prostomium entire, conical to bluntly conical, not incised; eyes and frontal processes absent. Buccal segment achaetous, apodous. Segments 2–3 reduced, apodous, with or without setae. Parapodia biramous from segment 4 to end of body. Parapodial lobes papillar to low-lying glandular mounds. Setae include limbate to smooth capillaries and furcate setae. Branchiae, parapodial cirri absent. Pygidium with or without anal cirri. Body segments either with transverse annuli or longitudinal striations; epidermis smooth.

**Remarks.**—The occurrence of a new species, described below, necessitates

emending the generic definition of *Neolipobranchius*. The type-species, *N. glaber*, was recognized by Hartman and Fauchald (1971:124) as a highly modified scalibregmatid having an entire prostomium, and lacking segmental annuli, parapodial lobes, furcate setae, and pygidial cirri. The emended generic definition of *Neolipobranchius* recognizes that the latter four characters are present in the genus. However, it must be emphasized that *Neolipobranchius* is unique amongst scalibregmatids in having an entire prostomium.

As such, this genus is not as strongly isolated in the family as previously suspected (Hartman and Fauchald 1971:124; Kudenov and Blake 1978; Blake 1981). For example, *Neolipobranchius*, *Polyphysia* Quatrefages, 1865, and *Kebuita* Chamberlin, 1919, are all assigned to Division II sensu Kudenov and Blake (1978: 440–441; see also Blake 1981:1157) for scalibregmatids having maggot-like bodies and lacking tentacular prostomial processes. In all, these three genera are represented to date by eight described species. The latter two genera possess incised prostomia (Division IIA), while *Neolipobranchius* has an entire prostomium (Division IIB). *Mucibregma* Fauchald and Hancock, 1981, may be incorrectly assigned to the scalibregmatids and is here excluded from Division II. Refer to the Discussion where *Mucibregma* is treated separately.

Division II species exhibit typical scalibregmatid features such as an achaetous buccal segment, branchiae, segmental annuli, epidermal tessellations, parapodia, furcate setae and pygidial cirri. However, these characters are not evenly distributed amongst species of this group, are generally reduced, and may be absent in such highly modified species as *Neolipobranchius glaber*. Described species of Division II differ generally from those of Division I (arenicoliform scalibregmatids having prostomial tentacular processes) in lacking acicular setae, parapodial cirri, and normally also pygidial cirri.

*Neolipobranchius blakei*, new species

Fig. 3

*Material examined*.—FLORIDA, GULF OF MEXICO: Citrus County, Crystal River, FSBC sta I-29172, EJ-81-104, approximately 18 km at 214 from mainland, 0.6 m, mouth of discharge channel, mixed algae primarily *Caulerpa* species, exposed limestone overlain by muddy sand and oyster shells, 14 Apr 1981, Applied Biology, Inc., colls; holotype (USNM 97283).

*Description*.—Body maggot-like, widest anteriorly, tapering posteriorly, measuring 3 mm long, 0.7 mm wide for 38 setigers (Fig. 3A); opaque white in alcohol. Prostomium bluntly conical, simple, lacking both eyes and lateral processes (Fig. 3A, B). Buccal segment and segments 2–3 (=setigers 1, 2) reduced, apodous, forming complete uniannulate rings (Fig. 3B); buccal segment achaetous; segments 2–3 with notopodial fascicles reduced or absent, lacking neurosetal fascicles (Fig. 3B). Segment 4 (=setiger 3) also reduced, about ½ the size of segment 5 (Fig. 3B). Parapodia biramous from segment 4 to end of body, as low-lying mound- to papilla-shaped lobes (Fig. 3A). Setae include smooth capillaries in all fascicles, and furcate setae with unequal tines from setiger 3, the latter having thin shafts anteriorly (Fig. 3C), becoming thicker posteriorly (Fig. 3D, E). Pygidium with 5 anal cirri (Fig. 3F). Body segments annulated with buccal segment and setigers 1–3, 31–38 uniannulate; setigers 4–18 quadriannulate; setigers 19–24 distended, annuli not recognizable; setigers 25–30 biannulate.

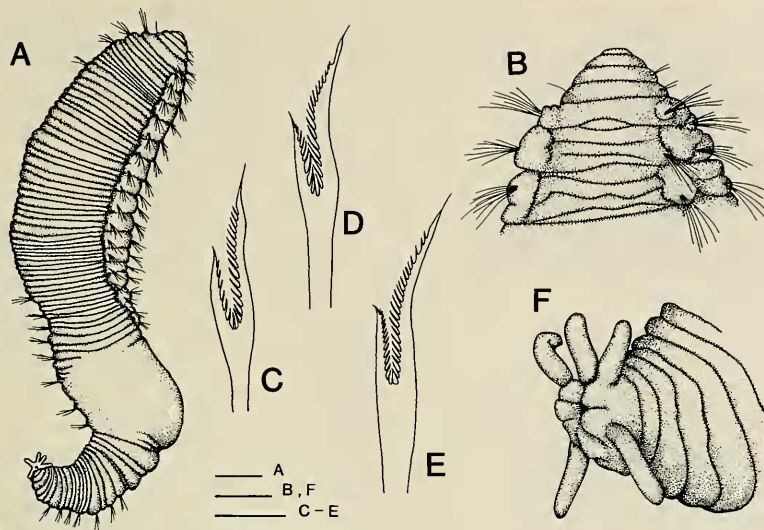


Fig. 3. *Neolipobranchius blakei* (holotype, USNM 97283): A, Entire worm, dorsal view; B, Anterior end, dorsal view; C, Furcate seta, setiger 5; D, Same, setiger 17; E, Same, setiger 29; F, Pygidium, right frontolateral view. Scale: A = 2 mm; B, F = 50  $\mu$ m; C-E = 10  $\mu$ m.

*Remarks.*—*Neolipobranchius blakei* differs from the only other described species, *N. glaber* (Hartman and Fauchald, 1971), in having capillary setae on segments 2–3, furcate setae, parapodia, pygidial cirri, and segmental annuli. This is the first record of the genus from a littoral habitat.

*Etymology.*—It is an honor to name this species for James A. Blake, teacher, friend, and fellow polychaetologist. The epithet is a noun in the genitive case.

*Distribution.*—Gulf of Mexico, 0.6 m.

#### *Sclerocheilus unoculus*, new species

Fig. 4

*Material examined.*—FLORIDA, GULF OF MEXICO: Sta 2852E, 28°30'00.4"N, 83°29'58.4"W, 22 m, medium sand, Aug 1977; 1 paratype (USNM 97287). Hourglass sta B, 27°37'N, 83°07'W, 18 m, EJ-67-111, coral, shell, sponge and algae bottom, 3 Apr 1967; holotype (USNM 97285). Same, EJ-67-370, same, 2 Nov 1967; 1 paratype (USNM 97284). Sta C, 27°37'N, 83°28'W, 37 m, EJ-67-28, coral and sponge bottom, 20 Jan 1967; 1 paratype (USNM 97286).

*Description.*—Body arenicoliform, widest anteriorly, tessellate, measuring up to 6 mm long, 1 mm wide without setae, for up to 46 setigers; opaque white in alcohol. Prostomium T-shaped, wider than long, with lateral processes stout, distally blunt (Fig. 4A). Eyes fused, connected medially by amorphous red pigment, forming a yoke across prostomium (Fig. 4A). Buccal segment apodous, achaetous, uniannulate dorsally and laterally, fused ventrally with setiger 1. Parapodia biramous, well developed, resembling flat triangular lobes anteriorly (Fig. 4A), becoming inflated, conical posteriorly (Fig. 4B, C). Dorsal cirri absent. Ventral cirri present in setigers 24–36, short, digitiform, inconspicuous (Fig. 4C, D). Setae include smooth capillaries in all rami; furcate setae having tines of unequal



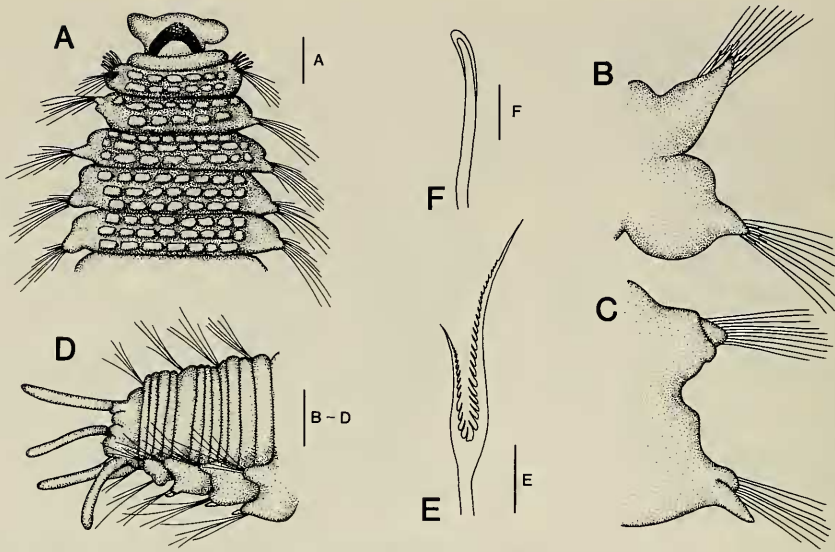


Fig. 4. *Sclerocheilus unoculus*: A–B, E–F, holotype (USNM 97285); C–D, paratype (EJ-67-28: USNM 97286). A, Anterior end, dorsal view; B, Right parapodium, setiger 16, posterior view; C, Right parapodium, setiger 29, posterior view; D, Furcate seta; E, Aciculum from setiger 1; F, Pygidium, right dorsolateral view. Scale: A = 2 mm; B–D = 50  $\mu$ m; E = 10  $\mu$ m; F = 20  $\mu$ m.

lengths in all rami except the first notopodium (Fig. 4E); and short acicular spines having nearly straight shafts, blunt tips and clear, loose fitting hyaline sheaths in notopodia of setiger 1 (Fig. 4F). Acicula arranged in 1 transverse row of 4–5 spines (Fig. 4A). Pygidium with 4 long anal cirri (Fig. 4D). Body segments annulated with setigers 1–2 biannulate; setigers 3–5 triannulate; and setigers 6 to end of body quadriannulate.

**Remarks.**—*Sclerocheilus unoculus* is most closely allied to *Sclerocheilus minutus* Grube in having a single transverse row of acicular spines in the notopodia of setiger 1. *Sclerocheilus unoculus* differs from *S. minutus* in having eyes fused and connected medially across the prostomium by a yoke of pigment, triannulate anterior segments instead of biannulate ones, acicular spines having distal sheaths, and greatly reduced ventral cirri. There is also a difference in the relative tine lengths of furcate setae (tine ratio 2.1 in *S. unoculus*; 1.3 in *S. minutus*).

**Etymology.**—The epithet *unoculus* derives from Latin terms *unus* meaning one, and *oculus* meaning eye. It is a noun in apposition.

**Distribution.**—Gulf of Mexico, 18–38 m.

### Discussion

Preliminary data on tine ratios for the furcate setae of *Asclerocheilus*, *Hyboscolex*, and *Sclerocheilus* (this study) corroborate findings presented by Blake (1981:1132) for five species of *Asclerocheilus*. For example, tine ratios for *Asclerocheilus mexicanus* do not coincide with values listed by Blake (1981). However, some variability must be present, although it is probably small. For example, tine ratios for *A. beringianus* Uschakov, 1955, from the Gulf of Mexico are 1.8 (Kudenov 1985), compared to 1.7 reported by Blake (1981:1132). Although tine

ratios are probably valid and useful taxonomic criteria, their ranges of variability must be determined before they can be used routinely.

The fact that scalibregmatids were becoming a polyphyletic assemblage of simply structured polychaetes (Fauchald 1977:43) was central to the review by Kudenov and Blake (1978) and the recent revision by Blake (1981). Fauchald and Hancock (1981:20) restated this concern in their description of a new scalibregmatid genus, *Mucibregma*. This genus is described as having a "T"-shaped prostomium, an extremely muscular peristomial segment, a dorsoventrally flattened body encased in a tough mucous sheath attached to a glandular peristomial ridge, biramous parapodia having acicular spines accompanied by long capillary setae, and in lacking furcate setae. However, examination of the type-species, *Mucibregma spinosum* Fauchald and Hancock, 1981, revealed significant anatomical features that are not associated with scalibregmatids. For example, the prostomium is not as conspicuously "T"-shaped in that the small prostomial processes project laterally and posteriorly (Fauchald and Hancock 1981, Pl. 3, fig. a). The extremely muscular and glandular peristomium is a character not encompassed by the family definition of scalibregmatids, and may include the presence of perhaps more than one achaetous segment in *Mucibregma*. Furthermore, the presence of heavy, spindle-shaped acicular spines accompanied by long, pliable capillary setae in all parapodia is simply not a scalibregmatid characteristic. Finally, scalibregmatids occupy burrows, and apparently do not construct tubes (Fauchald and Jumars 1979:245) such as that made by *Mucibregma*. However, in light of such unusual features, Fauchald and Hancock (1981) assigned *Mucibregma* to Division II scalibregmatids (sensu Kudenov and Blake 1978) for worms having maggot-like bodies and lacking distinct tentacular processes. However, Fauchald and Hancock do not define their new category "C," and it is surmised that their subcategory "1" refers to the absence of gills in *Mucibregma*. Overall, it appears that the inclusion of *Mucibregma* in the Scalibregmatidae results in an inappropriately polyphyletic taxon.

By contrast, *Mucibregma* appears to exhibit a greater affinity to the Fauveliopsidae Hartman and Fauchald 1971. For example, the primary criterion suggesting this relationship is the fascicles of thick spindle-shaped spines accompanied by long capillary setae present in all fascicles of both *Mucibregma* and *Fauvelopsis*. There is also a superficial similarity in the shape of the prostomia, which are bluntly rounded anteriorly; the posterolateral regions are not fused to the body in *Mucibregma* and are fused with the buccal segment in *Fauvelopsis* (Kudenov, unpublished data). Furthermore, both taxa lack furcate setae, which may simply be an example of convergence, and should probably not be weighted unduly. These two taxa differ from one another in that the anterior fragment on which *Mucibregma* is defined lacks the interramal papillae that are typically present in *Fauvelopsis*; it also has an extremely well developed peristomium. It is therefore suggested that *Mucibregma* be temporarily referred to the Fauveliopsidae. Although this association needs to be examined in greater detail, such a study may reveal that *Mucibregma* will need to be assigned to a separate family.

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